

## AMERICAN WHITE PELICANS: THE LATEST AVIAN PROBLEM FOR CATFISH PRODUCERS

D. TOMMY KING, United States Department of Agriculture, Animal and Plant Health Inspection Service, Animal Damage Control, Denver Wildlife Research Center, Mississippi Research Station, P.O. Drawer 6099, Mississippi State University, MS 39762

**ABSTRACT:** Animal Damage Control offices in Arkansas, Louisiana, and Mississippi began receiving complaints concerning American white pelicans (*Pelecanus erythrorhynchos*) foraging in commercial channel catfish (*Ictalurus punctatus*) ponds in 1990. Because of the relatively shallow pond depth and high fish stocking rates used by most producers, commercial catfish ponds provide a near perfect foraging environment for American white pelicans. Since 1993, pelicans seem to have become more persistent in their foraging efforts and therefore, more difficult to disperse from catfish farms. Damage abatement recommendations have consisted of harassment measures similar to those used for other piscivorous birds, issuance of depredation permits, and draining water from fields used as loafing sites. In order to learn more about pelican numbers and movements Animal Damage Control, Denver Wildlife Research Center (ADC/DWRC) biologists began aerial censuses in the Delta Region of Mississippi and a radio-telemetry study during the winter of 1993-1994. Information provided by these studies will be used to develop American white pelican damage management strategies in the southeastern United States and elsewhere.

---

Proc. East. Wildl. Damage Mgmt. Conf. 7:31-35. 1997

The production of farm raised channel catfish in the southeastern United States has increased dramatically in the last 20 years. In 1994, the southeast led the nation in production of farm raised catfish with approximately 57,000 ha of ponds. In Mississippi alone, 37,450 ha of catfish ponds were in production (USDA 1994). In a 1988 survey, Mississippi catfish producers estimated that they spent \$2.1 million per year on efforts to control depredation by fish eating birds (Stickley and Andrews 1989). A catfish producer in south Louisiana estimated annual predation costs (ie. pyrotechnics and ammunition, road maintenance, vehicle maintenance, labor costs for bird chasers, and fish loss) primarily from American white pelicans at \$173,282 (A. Gaudé, Mgr., Clearwater Cajun Fisheries, pers. comm.).

In 1990, Animal Damage Control offices in Arkansas, Louisiana, and Mississippi began receiving complaints concerning American white pelicans foraging in catfish ponds. Pelicans are usually present in the southeast from November through May, but in 1995 several hundred pelicans remained in Louisiana and Mississippi until late June. As many as 1000 pelicans have been observed foraging in one 5 ha pond in Mississippi

(USDA/ADC, unpubl. data). Although little is known about pelican energetic demands, Lingle (1977) found that at Chase Lake National Wildlife Refuge, North Dakota breeding adult pelicans consumed about 0.6 kg of food per day. Catfish up to 34 cm in length in stomachs and several  $\geq 53$  cm catfish stuck in throats were found during necropsies of pelicans collected from the Delta Region of Mississippi. The pelicans apparently tried to swallow the  $\geq 53$  cm catfish tail first and the pectoral spines of the catfish pierced the pelican's throat, preventing swallowing (USDA/ADC unpubl. data). Understandably, the presence of large numbers of wintering pelicans is an unwelcome sight to catfish producers. This manuscript examines the emerging role of the American white pelican as a predator at aquaculture facilities in Arkansas, Louisiana, and Mississippi.

I would like to thank all of the landowners who provided access to their property and K. Bruce, T. Carpenter, R. Gaudé, J. Glahn, D. LeBlanc, P. Mastrangelo, D. Mott, J. Paulson, D. Reinhold, B. Sloan, P. Smith, and A. Wilson for their assistance with pelican capture and processing. I also thank B. Nygren of Nygren Air Service for many enjoyable hours flying. I also thank T. Booth, D. LeBlanc, P.

Mastrangelo, and B. Sloan for providing information about pelican problems. J. Cummings, J. Glahn, A. Grewe, Jr. and D. Mott provided helpful comments on this manuscript.

### LOAFING AND FORAGING STRATEGIES

Pelican loafing groups may vary in size from <100 to several thousand. In Arkansas and the Delta Region of Mississippi, pelicans loaf in flooded agricultural fields when the Mississippi River is high and sand bars and mud flats are inundated. When the Mississippi River is low and there are few available flooded fields, pelicans loaf on exposed mud flats and sand bars in the river and large lakes. Agricultural fields intentionally flooded for wintering waterfowl use seem particularly attractive to pelicans. Most pelican loafing sites in the southeast are open flat areas with little, if any, surrounding vegetation. In the Delta Region of Mississippi, pelicans seem to be wary and usually abandon a loafing site if the area is disturbed by increased human activity. In south Louisiana however, pelicans seem less wary, and have used the same crawfish pond levees as loafing sites for the past several years, despite human activity.

American white pelicans use a variety of foraging techniques such as foraging singly, in small groups (2-25 birds), or in large groups (>25 birds). When foraging singly, or in small groups, pelicans usually dip their bills searching for food as they swim. When cooperatively foraging, pelicans usually attempt to herd their prey toward shallow water by swimming side by side and synchronously dipping their bills (Anderson 1987, Hart 1989, McMahon and Evans 1992, Johnsgard 1993). Pelicans have been known to fly up to 305 km from a breeding colony to a forage site (Johnson 1976) and prefer to forage in shallow water (Anderson 1987, Johnsgard 1993). Due to the relatively shallow pond depth (approximately 1.5 m) and high fish stocking rates used by most catfish producers in the southeast, catfish ponds seem to be a near perfect foraging environment for pelicans.

### POPULATION STATUS

Most pelican biologists believe that American white pelicans are separated into 2 generally distinct populations by the continental divide (D. Anderson, Univ. CA, Davis; A. Grewe, Jr., St. Cloud State Univ., MN; T. Pabian, USFWS, Chase Lake National Wildlife Refuge, ND; pers. comm.). In 1981, the entire North American population of American white pelicans was estimated at 109,000, with about 77,000 birds wintering and summering east of the Rocky Mountains (Johnsgard 1993). Although published data on the status of the pelican population since 1981 is lacking, the current eastern population is estimated at 70,000-120,000 birds (A Grewe, Jr. and T. Pabian, pers. comm.).

In the United States, the largest known breeding colonies of American white pelicans east of the Rocky Mountains are at Chase Lake National Wildlife Refuge, North Dakota and Marsh Lake, Minnesota. It is believed that each year these 2 colonies produce approximately 85% of the young of the eastern United States population (A Grewe, Jr. and T. Pabian, pers. comm.).

The colony at Marsh Lake, Minnesota is the only large pelican colony with an active banding program. Al Grewe, Jr. (pers. comm.) has banded 2000 + young pelicans each summer for the last several years. All pelican bands that have been recovered in the Delta Region of Mississippi and south Louisiana since 1990 are from the Marsh Lake colony. Young pelicans were regularly banded at Chase Lake National Wildlife Refuge until the early 1980's (Tom Pabian, pers. comm.).

### D A M A G E      A B A T E M E N T RECOMMENDATIONS

Prior to the winter of 1992-1993, pelican depredations at catfish facilities in Arkansas and the Delta Region of Mississippi were limited to short infrequent visits and the birds were easily dispersed from the area. During the last 2 years however, pelicans seem to have become more persistent in their foraging efforts and therefore, more difficult to disperse from catfish farms. Damage abatement

recommendations have consisted of harassment measures similar to those used for other piscivorous birds (i.e., harassment patrols, pyrotechnics, electronic noise devices, human effigies, and propane cannons), issuance of USFWS depredation permits, and draining water from flooded fields used as pelican loafing sites (USDA/ADC, unpubl. data). Since pelicans often forage at night, 24 hr harassment patrols become necessary in areas experiencing problems. In south Louisiana, nocturnal foraging pelicans have been easily frightened from catfish ponds by bright spotlights (A. Gaudé, pers. comm.)

Prior to winter and spring 1995, pelicans in Arkansas, south Louisiana and Mississippi usually foraged in large flocks. It was common to see  $\geq 300$  pelicans flying to catfish ponds, foraging, and leaving in one flock. Last year, however, for most of the winter in south Louisiana and late spring in Arkansas and Mississippi pelicans foraged in small flocks (1-50 birds) and many small flocks would spread out over the entire catfish complex, therefore making harassment and dispersal much more difficult. This change in foraging strategy may be a result of increased harassment of the birds at catfish ponds.

## RESEARCH

In order to learn more about pelican numbers and movements, ADC/DWRC biologists began aerial censuses in the Delta Region of Mississippi and a multi-year radio-telemetry study during the winter of 1993-1994. Aerial censuses show that pelican numbers are highest during spring migration (Table 1). These high spring census numbers coincide with an increase in pelican damage complaints (USDA/ADC, unpub. data). Preliminary census data indicate that the varying number of pelicans observed in the Delta Region of Mississippi may also be dependent on the river stages and availability of suitable mud flats and flooded fields for loafing areas.

Initial capture attempts in the Delta Region of Mississippi included the use of a rocket net, a shoulder fired netgun, and the rotor downwash from

a helicopter at pelican loafing sites. Due to the wariness of the pelicans and logistical problems, these methods proved unsuccessful. Although leghold traps are primarily used for capturing mammals, padded leghold traps have been used to humanely capture raptors and ravens (Imler 1937, Harmata 1984, Bloom 1987, E. Knittle, ADC/DWRC, pers. comm.). Victor #3 Softcatch traps were modified with weaker springs, additional swivels and a shock cord and were set underwater at pelican loafing sites. In the Delta Region of Mississippi, 12 pelicans were successfully captured using this method.

In Louisiana, a portable rocket-net system (Grubb 1988, 1991) set on crawfish pond levees being used as loafing sites was used to capture 54 pelicans in April 1995. These pelicans did not seem to be as wary of changes to their loafing sites as the pelicans in Mississippi. This may be due to the constant water level in the crawfish ponds from fall through spring. Therefore, these birds were consistently able to use the same loafing sites.

So far, 20 pelicans have been captured and fitted with radio transmitters in the Delta Region of Mississippi and south Louisiana. Preliminary data show pelicans that loaf on bars in the Mississippi River or on large lakes adjacent to the river seem to spend about equal amounts of time foraging (in the river and lakes) and loafing. Pelicans loafing in flooded fields and foraging in catfish ponds tend to spend most of their time loafing and less time foraging. This is probably due in part to the limited time needed for pelicans to obtain their daily food requirements from catfish ponds.

## MANAGEMENT IMPLICATIONS

Further research on the population status of American white pelicans is needed to provide information necessary for assessing their damage potential and for recommending issuance of USFWS depredation permits. Completion of this radio telemetry study will provide information on movements and activity budgets of pelicans and their impact on aquaculture. This information will be used to develop American white pelican damage

management strategies in the southeastern United States and elsewhere.

## LITERATURE CITED

- Anderson, J. G. T. 1987. Foraging behavior of American white pelicans (Pelecanus erythrorhynchos) in western Nevada. Ph.D. Dissertation, Univ. Rhode Island. 91pp.
- Bloom, P. H. 1987. Capturing and handling raptors. Pages 99-124 in B. A. Giron Pendleton, B. A. Millsap, K. W. Cline, and D. M. Bird, eds., Raptor management techniques manual. Natl. Wildl. Fed., Washington, DC.
- Grubb, T. G. 1988. A portable rocket-net system for capturing wildlife. U.S. For. Serv., Rocky Mtn. For. and Range Exp. Stn. Res. Note RM-484. 8pp.
- . 1991. Modifications of the portable rocket-net capture system to improve performance. U.S. For. Serv., Rocky Mtn. For. and Range Exp. Stn. Res. Note RM-502. 5pp.
- Harmata, A. R. 1984. Bald eagles of the San Luis Valley, Colorado; their winter ecology and spring migration. Ph.D. Dissertation, Montana State Univ., Bozeman, MT.
- Hart, S. D. 1989. American white pelican (Pelecanus erythrorhynchos) populations, kleptoparasitism, and other foraging behaviors at American Falls Reservoir, southeast Idaho. M.S. Thesis, Idaho State Univ. 99pp.
- Imler, R. H. 1937. Methods of taking birds of prey for banding. Bird-Banding 8:156-161.
- Johnsgard, P. A. 1993. Cormorants, darters, and pelicans of the world. Smithsonian Inst. Press, Washington, D.C. 445pp.
- Johnson, R. F., Jr. 1976. Mortality factors affecting a white pelican population, Chase Lake National Wildlife Refuge, North Dakota. M.S. Thesis, Mich. Technol. Univ.
- Lingle, G. R. 1977. Food habits and aging criteria of the white pelican at Chase Lake National Wildlife Refuge, North Dakota. M.S. Thesis, Mich. Technol. Univ. 57pp.
- McMahon, B. F. and R. M. Evans. 1992. Foraging strategies of American white pelicans. Behaviour 120:69-89.
- Stickley, A. R., Jr., and K. J. Andrews. 1989. Survey of Mississippi catfish farmers on means, effort and costs to repel fish-eating birds from ponds. Proc. East. Wildl. Damage Control Conf. 4:105-108.
- United States Department of Agriculture. 1994. Aquaculture situation and outlook. Economic Res. Ser. AQS-13, Washington, D.C. 47pp.

Table 1. Aerial census dates and numbers of American white pelicans counted in the Delta Region of Mississippi.

<u>Date</u>	<u>1993-1994</u>	<u>Date</u>	<u>1994-1995</u>
	<u>No. Birds</u>		<u>No. Birds</u>
18 Nov.	1943	14 Nov.	1237
11 Dec.	1340	12 Dec.	575
15 Jan.	1364	4 Jan.	335
		24 Jan.	920
24 Feb.	2365	7 Feb.	1185
		27 Feb.	2043
		8 Mar.	1584
		28 Mar.	3263
		13 Apr.	922
		25 May	64